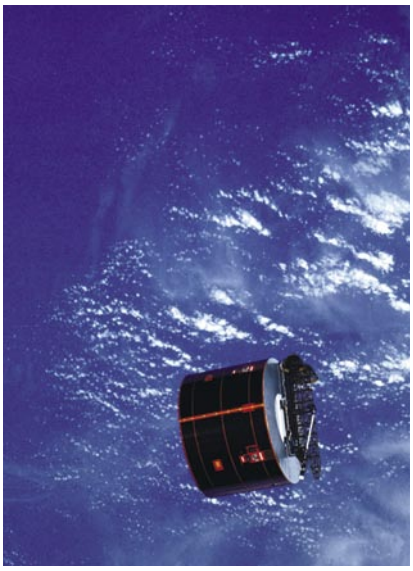
technology ■ opportunity

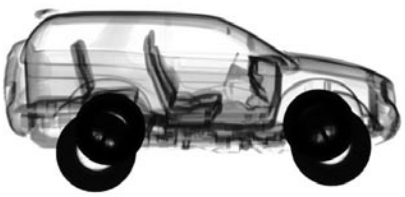
National Aeronautics and Space Administration

computer software

A Program for Integration of Structural Dynamics Analysis and Test

...automating and accelerating pre-test analysis, test execution, decision making, and test reporting





NASA Goddard Space Flight Center is developing an Integrated Structural Dynamic Analysis and Test Program software package that enables near real-time test and analysis performance as well as organization and integration of test and analysis data. The software helps address the limitations faced by repetitive structural dynamics test and analysis data processes for mechanical verification that lack standardization, interfacing, and integration.

This portable, easy-to-use program automates repetitive processes and accelerates pre-test analysis and test reporting. By facilitating faster, more efficient mechanical verification, the program offers structural dynamic analysis or test software companies much potential to promote cost- and time-saving packaged solutions by either expanding their product line to include this software or by integrating it into current software packages.

Benefits

- **Fast**: Processes test data in near real-time
- **Integrated**: Integrates multiple input and output formats, helping to reduce the need for unrelated programs and hand calculations
- **Portable**: Is PC-based, so users and analysts can access it from any convenient location
- **User friendly**: Is simple to navigate and use, with access from Microsoft Windows
- **Scalable**: Enables new routines or external executables, supporting unlimited growth
- **Automated**: Automates reporting of all analysis and test information in graphic, tabular, or data matrix formats, improving efficiency and reducing errors

Applications

Although originally developed for space systems, this software package could be adapted for use in other mechanical, vibration, or structural dynamic analysis applications:

- Airframe design and testing
- Weapons systems
- Engine design (gas turbine, internal combustion)
- Automobile and truck design

The Technology

The easy-to-use Integrated Structural Dynamic Analysis and Test Program consists of five modules:

1. Sine and random vibration
2. Shock and time replication
3. Acoustics
4. Base driven modal survey
5. Mass properties and static/dynamic balance

Goddard's program uses Microsoft Excel 2000 or higher, and the programming language is Microsoft Visual Basic. The program is commanded using ActiveX Controls. The user interface is very friendly, and the program is accessible and simple to use.

Processing and integrating analysis and test data

Both test and analysis data files can be input for processing by simply opening a Windows Explorer display. Depending on the type of input file, the program begins the "test data process" or the "analysis data process." Analysts can check processing status in the Microsoft status bar. In this fashion, the program integrates the repetitive structural dynamic test and analysis data processes using a common interface. The results of the complete test and analysis cycle can then be reported in graphical, tabular, and matrix formats. Analysts can also collect the processed data and store it in a database for future projects and storage.

Why integration is better

Without a standard format, structural dynamic analysis and test data processes suffer many inefficiencies. Ad-hoc means of correlating the two processes into a single, streamlined system required the use of disparate programs and additional resources to devote to hand calculations and other measures to link the programs together. These prior methods could not come close to providing real-time processing of test and analysis data. Further, these outdated methods required analysts to spend time processing data rather than interpreting–and gaining real value–from it.

The Integrated Structural Dynamic Analysis and Test Program replaces these old methods as well as the traditional laboratory printouts and waiting periods for data to be processed electronically once testing is complete. With this new innovation, the near real-time processing and integration of test and analysis data is now possible, enabling structural analysts to improve productivity, save time, and reduce errors.

Patents

NASA Goddard is seeking patent protection for this technology.

Licensing and Partnering Opportunities

This technology is part of NASA,s Innovative Partnerships Program, which seeks to transfer technology into and out of NASA to benefit the space program and U.S. industry. NASA invites companies to consider licensing the Integrated Structural Dynamic Analysis and Test Program (GSC-14775-1) for commercial applications or for further development.

For More Information

If you are interested in more information or want to pursue transfer of this technology (GSC-14775-1), please contact:

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More information about working with NASA Goddard's Office of Technology Transfer is available online:
http://techtransfer.gsfc.nasa.gov